Apache Hose

CASE SUMMARY 3

APACHE HOSE AND BELTING

Cedar Rapids, Iowa
Linn County

Intern: Adam Crutchley
Major: Agricultural Engineering
School: Iowa State University

The Company

Apache Hose and Belting is a fabricator and retailer of conveyor belts, hoses, and cut rubber parts. Apache is an employee owned company with distribution and sales branches in Minneapolis, MN, Kansas City, MO, St. Louis, MO, and Chicago, IL. At the company headquarters in Cedar Rapids, Apache fabricates conveyor belts, air and material handling hoses, and cut rubber parts.

Project Background

Apache Hose and Belting focused the internship on reducing water and energy used in the fabrication process. Alternatives of solid waste disposal were also to be investigated by the intern.

Incentives to Change

Apache wished to reduce operational cost and decrease the amount of material currently sent to the landfill. Specifically, Apache desired to locate a profitable market for scrap belting material.

Results

Water is purchased from the city and used to cool presses used in conveyor belt fabrication. Water passes through a cooling platen once before entering the sewer. The recommendation is that Apache install a closed loop cooling system to recover an estimated 1,160,000 gallons of water annually. The water can be cycled through the machines from a central reservoir and pumped back to the reservoir. The system can be paid back in about 14 months.

Electricity is required to power the 400 watt metal halide bulbs used to provide light to the plant. By switching to a 360 watt bulb with equal light output and rated life, Apache can reduce its electricity use by 42,300 kWh each year. Each bulb will cover its increased cost in 77 days.

Natural gas is used to provide heat to Apache in the winter months. A large portion of the energy, 2540 MMBtu/year, is lost through exhaust fans in the ceiling designed to remove smoke caused by some of the operations. A heat recovery system resembling a concentric tube counter flow heat exchanger eliminates the need for the exhaust fans by removing the smoke recovering the heat. Energy saved based on the heat recovery system studies is 1,528 MMBtu/year. A payback period of 3.6 to 7 years is expected, dependent upon natural gas prices.

GOVERNMENT ACADEMIA BUSINESS pollution prevention Water Reduction

Belt scrap is a result of Apache's belt production process. Scrap is generated by cutting inventory to the correct size to fill customers orders. Some of the material is reused as belts of various parts produced by the cut rubber parts department. A portion of the material is sent to Siouxland Mat to be used in the production of doorway entrance mats. It is recommended that Apache develop a sorting system to organize and inventory scrap to be directed to the correct outlet. It would also be beneficial for Apache to develop other products to be produced from the scrap belt such as wheel clocks and dock bumpers. Savings are estimated and based on landfill cost.

Most of the hose material that Apache receives is wrapped in stretch wrap. In addition Apache wraps certain belts with stretch wrap to increase shelf life or to keep the belt clean. The entire amount of stretch wrap, 4.5 tons/year, is placed in the landfill, occupying 220 yd3/year. The recommendation to Apache is to bale the material, which can be hauled away and recycled. The payback period for a baler is about 2.3 years with the approval of a grant through Bluestem Solid Waste Agency's Outreach Investment Program.

Waste Reduction Option	Waste Reduced	Reduction of overall use	Cost savings	Status
Water reduction	1.16 million gallons/year	33 percent	$3,364/year	Implementation in progress
Electricity reduction	42,300 kWH/year	3 percent	$2,600-$2,800/year	Implementation in progress
Natural gas reduction	1,518 MMBtu/ year	19 percent	$5,783-$11,232/year	Recommended
Scrap belt reduction	102 tons/year	50 percent	$5,000/year	Recommended
Stretch wrap recycling	4.5 tons/year	100 percent	$600/year	Implementation in progress